Cervicam Indonesia

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The Simple Acetowhite Labeling System For Artificial Intelligence Dataset Preparation

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Background

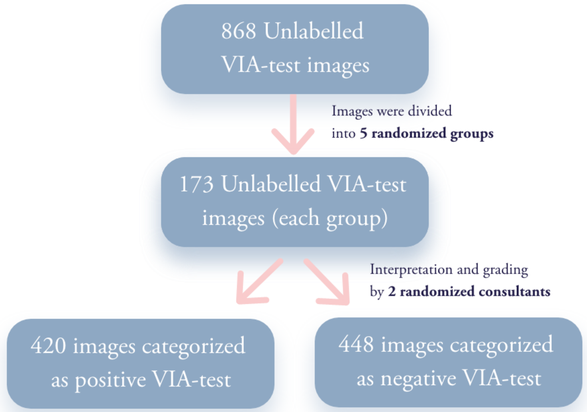
In Indonesia, cervical cancer is the 2nd most common malignancy in women.[1] Routine screening is a key to prevent disease progression. **The visual inspection with acetic acid (VIA)** is considered cost-effective and widely available.[2] However, **interpretation of the result may vary among workers. Emerging artificial intelligence (AI) technology may provide the solution to minimize the variability.** However, designing such technology requires big, validated data. Therefore, this research aims to build **a web-based medical image repository system with automatic 'vote-based' image categorization** system to make it easier to collect & manage VIA-test images dataset for training such robust AI technology.

Method

The system was built on Laravel PHP framework version 7 and deployed on Intel® Xeon® CPU E5-2640 @2.40 GHz, 6 gigabytes of RAM server running Ubuntu 20.04 LTS, PHP 7.4.3, MySQL 8.0.23, and NginX 1.18.0. **Collected unlabeled VIA-test images from our database are stored on the system.**

Results

The source code for the system, **"Simple Acetowhite Labeling"**, **was available for access** through CerviCam Research Group GitHub Repository (https://github.com/CerviCam/Simple-Acetowhite-Labeling-Web-Application). The categorized images are archived together as a dataset which is then further used to train AI models for interpreting results of VIA-test images.



Discussion

Our system was able to provide :

- **Practicality** — in accessing and categorizing VIA-test image collection.
- **Accessible** — Being a website-based platform, the system is accessible through internet.
- **Adaptability** — Ease of adaptability for medical image repository for other health institutions.

Further studies & development : **User Interface** **Subjectivity**

Conclusion

The development of the "Simple Acetowhite Labeling" system as a web-based medical image repository system is an initial step toward creating AI technology in automatizing VIA-test result's interpretation. The system was designed to manage VIA-test image collection & further generate datasets to create & train AI models.

References

1. IARC. Indonesia fact sheet [Internet]. France: The Global Cancer Observatory; 2021 [cited 2021 Mar 21]. Available from: https://gco.iarc.fr/today/data/factsheets/populations/360-indonesia-fact-sheets.pdf
2. Poli UR, Bidinger PD, Gowrishankar S. Visual inspection with acetic acid (VIA) screening program: 7 years experience in early detection of cervical cancer and pre-cancers in rural South India. Indian J Community Med. 2015 Jul-Sep; 40(3):203-7. doi: 10.4103/0970-0218.158873.